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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/996,200	11/28/2001	Todor G. Georgiev	07844-495001	1276

21876 7590 03/12/2004

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EXAMINER	
YANG, RYAN R	

ART UNIT	PAPER NUMBER
2672	

DATE MAILED: 03/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/996,200	Applicant(s) GEORGIEV, TODOR G.	
	Examiner Ryan R Yang	Art Unit 2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 December 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 10-39* is/are rejected.

7)☒ Claim(s) *7-9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. This action is responsive to communications: Amendment, filed on 12/29/2003. This action is final.

2. Claims 1-39 are pending in this application. Claims 1, 16 and 31 are independent claims. In the Amendment, filed on 12/29/2003, claims 1, 5-7, 16, 20-22 and 31 were amended.

3. The present title of the invention is "Tool for extracting and manipulating components of warping transforms" as filed originally.

Claim Rejections - 35 USC § 102

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1-3, 10-11, 13-18, 25-26, 28-32, 34-35 and 37-39 are rejected under 35 U.S.C. 102(b) as being anticipated by Thomas etal. (ACM, Nov 1995).

5. As per claim 1,Thomas et al., hereinafter Thomas, discloses a method comprising:

in response to user action on a canvas, selecting at least one area of a first image which relates to an area on a distortion grid (Figure 3 where a corner of the object is grabbed for scaling);

using a plurality of points local to the at least one area to calculate a distortion local to the area (Figure 3 where the area close to the selected corner is distorted; the distortion is not limited to one point but to a plurality of points local to the area);

extracting at least one component of the distortion (the scaling factor for Figure 3); and

applying the at least one component to a second area of the first image (Figure 3 where the other corners are also distorted).

6. As per claim 2, Thomas demonstrated all the elements as applied to the rejection of independent claim 1, supra, and further discloses the at least one component of the distortion is one of displacement, rotation, magnification, skew and directional scaling (Figure 3 has scaling as an example).

7. As per claim 3, Thomas demonstrated all the elements as applied to the rejection of dependent claim 2, supra, and further discloses the extracting comprises calculating an affine transform from the plurality of points (Figure 3 where scaling is one component of affine transformation and "The original Transformation object supported only affine transformation such as rotation, scaling, and translation", page 7, last paragraph).

8. As per claim 10, Thomas demonstrated all the elements as applied to the rejection of independent claim 1, supra, and further discloses wherein a user selects the at least one component ("The editor supports the creation of simple figures such as lines and polygons, and it allows simple editing operations such as moving, scaling,

and rotating. Figure 1 shows a screen image of the editor being used to move an object.", page 4, column 2, line 43-47).

9. As per claim 11, Thomas demonstrated all the elements as applied to the rejection of dependent claim 10, supra, and further discloses wherein the user selects the at least one component from a menu displayed on a user interface (page 5, Figure 1).

10. As per claim 13, Thomas demonstrated all the elements as applied to the rejection of independent claim 1, supra, and further discloses the applying is to an entire image (Figure 1 where the entire area can be applied).

11. As per claim 14, Thomas demonstrated all the elements as applied to the rejection of independent claim 1, supra, and further discloses the applying is to a second image ("The editor supports the creation of simple figures such as lines and polygons", page 4, line 43-44).

12. As per claim 15, Thomas demonstrated all the elements as applied to the rejection of dependent claim 14, supra, and further discloses the second image is different from the first image ("The editor supports the creation of simple figures such as lines and polygons", page 4, line 43-44, where lines and polygons are different).

13. As per claim 16, Thomas discloses a computer program product, disposed in a computer readable medium, having instructions to cause a computer to:

using a plurality of points surrounding a first area of an image related to an area in a distortion grid, calculate at least one component of a distortion at the first area (Figure 3 where a corner of the object is grabbed for scaling and the area close to the

selected corner is distorted; since the distortion is not limited to one point but to a plurality of points local to the area); and

apply the at least one component of the distortion to a second area of the image (Figure 3 where the other corners are also distorted).

14. As per claim 17, Thomas demonstrated all the elements as applied to the rejection of independent claim 16, supra, and further discloses the at least one component of the distortion is one of displacement, rotation, magnification, skew and directional scaling (Figure 3 has scaling as an example and "The original Transformation object supported only affine transformation such as rotation, scaling, and translation", page 7, last paragraph).

15. As per claim 18, Thomas demonstrated all the elements as applied to the rejection of dependent claim 17, supra, and further discloses instructions to cause a computer to calculate an affine transform from the plurality of points (Figure 3 where scaling is one component of affine transformation and "The original Transformation object supported only affine transformation such as rotation, scaling, and translation", page 7, last paragraph).

16. As per claim 25, Thomas demonstrated all the elements as applied to the rejection of independent claim 16, supra, and further discloses wherein a user selects the at least one component ("The editor supports the creation of simple figures such as lines and polygons, and it allows simple editing operations such as moving, scaling, and rotating. Figure 1 shows a screen image of the editor being used to move an object.", page 4, column 2, line 43-47).

17. As per claim 26, Thomas demonstrated all the elements as applied to the rejection of dependent claim 25, supra, and further discloses wherein the user selects the at least one component from a menu displayed on a user interface (page 5, Figure 1).

18. As per claim 28, Thomas demonstrated all the elements as applied to the rejection of independent claim 16, supra, and further discloses the applying is to an entire image (Figure 1 where the entire area can be applied).

19. As per claim 29, Thomas demonstrated all the elements as applied to the rejection of independent claim 16, supra, and further discloses the applying is to a second image ("The editor supports the creation of simple figures such as lines and polygons", page 4, line 43-44).

20. As per claim 30, Thomas demonstrated all the elements as applied to the rejection of dependent claim 14, supra, and further discloses the second image is different from the first image ("The editor supports the creation of simple figures such as lines and polygons", page 4, line 43-44, where lines and polygons are different).

21. As per claim 31, Thomas discloses a computer program product having instructions stored in a computer readable medium, containing instructions to cause a computer to:

display a first image on a canvas (Figure 1);

responsive to an input device controlled by a user, select an area of the first image (Figure 3 where a corner of the object is grabbed for scaling);

responsive to a selection by the user from a menu, extract at least one component of a distortion from the area (the scaling factor for Figure 3); and

responsive to movement and location of a cursor controlled by the user, apply the at least one component to a second area of the first image (Figure 3 where the other corners are also distorted).

22. As per claim 32, Thomas demonstrated all the elements as applied to the rejection of independent claim 31, supra, and further discloses wherein the input device is a mouse ("the part of the object that is "grabbed" is controlled by the mouse", page 5, line 5-6).

23. As per claim 34, Thomas demonstrated all the elements as applied to the rejection of independent claim 31, supra, and further discloses the at least one component of the distortion is one of displacement, rotation, magnification, skew and directional scaling (Figure 3 has scaling as an example and "The original Transformation object supported only affine transformation such as rotation, scaling, and translation", page 7, last paragraph).

24. As per claim 35, Thomas demonstrated all the elements as applied to the rejection of independent claim 31, supra, and further discloses instructions to cause a computer to calculate an affine transform from the plurality of points (Figure 3 where scaling is one component of affine transformation and "The original Transformation object supported only affine transformation such as rotation, scaling, and translation", page 7, last paragraph).

25. As per claim 37, Thomas demonstrated all the elements as applied to the rejection of independent claim 31, supra, and further discloses the applying is to an entire image (Figure 1 where the entire area can be applied).

26. As per claim 38, Thomas demonstrated all the elements as applied to the rejection of independent claim 16, supra, and further discloses the applying is to a second image ("The editor supports the creation of simple figures such as lines and polygons", page 4, line 43-44).

27. As per claim 39, Thomas demonstrated all the elements as applied to the rejection of dependent claim 31, supra, and further discloses the second image is different from the first image ("The editor supports the creation of simple figures such as lines and polygons", page 4, line 43-44, where lines and polygons are different).

Claim Rejections - 35 USC § 103

28. Claims 4, 19 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas et al. as applied to claim 1 above, and further in view of Reyzin (6,215,915).

29. As per claim 4, Thomas demonstrated all the elements as applied to the rejection of dependent claim 3, supra.

Thomas discloses a method of distorting an area of an image using affine transformation. It is noted that Thomas does not explicitly disclose the extracting further comprises decomposing the affine transform into a translation and a linear transform matrix, however, this is known in the art as taught by Reyzin. Reyzin

discloses a method of transformation in which the affine transformation is decomposed into a translation part and a linear transform matrix (column 3, line 15-30 where (Xo,Yo) is the translation part and M is the transform matrix).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Reyzin into Thomas because Thomas discloses a method of distorting an area of an image using affine transformation and Reyzin discloses the affine transformation can be decomposed into two components in order to be able to better analyze the transformation.

30. As per claim 19, Thomas demonstrated all the elements as applied to the rejection of dependent claim 18, supra.

Thomas discloses an instruction of a method of distorting an area of an image using affine transformation. It is noted that Thomas does not explicitly disclose the extracting further comprises decomposing the affine transform into a translation and a linear transform matrix, however, this is known in the art as taught by Reyzin. Reyzin discloses a method of transformation in which the affine transformation is decomposed into a translation part and a linear transform matrix (column 3, line 15-30 where (Xo,Yo) is the translation part and M is the transform matrix).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Reyzin into Thomas because Thomas discloses a method of distorting an area of an image using affine transformation and Reyzin discloses the affine transformation can be decomposed into two components in order to be able to better analyze the transformation.

31. As per claim 36, Thomas demonstrated all the elements as applied to the rejection of dependent claim 35, supra.

Thomas discloses a method of distorting an area of an image using affine transformation. It is noted that Thomas does not explicitly disclose the extracting further comprises decomposing the affine transform into a translation and a linear transform matrix, however, this is known in the art as taught by Reyzin. Reyzin discloses a method of transformation in which the affine transformation is decomposed into a translation part and a linear transform matrix (column 3, line 15-30 where (Xo,Yo) is the translation part and M is the transform matrix).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Reyzin into Thomas because Thomas discloses a method of distorting an area of an image using affine transformation and Reyzin discloses the affine transformation can be decomposed into two components in order to be able to better analyze the transformation.

32. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas as applied to claim 1 above, and further in view of Foley et al. (Computer Graphics: Principles and Practice, 2nd Edition).

33. As per claim 5, Thomas demonstrated all the elements as applied to the rejection of dependent claim 3, supra.

Thomas discloses a method of distorting an area of an image using affine transformation. It is noted that Thomas does not explicitly disclose the extraction of magnification comprises calculating the determinant of a linear transform matrix,

however, this is known in the art as taught by Foley et al., hereinafter Foley. Foley discloses that "the determinant of the matrix tells us ... how much the cube is expanded or contracted by the transformation, page 1104, line 2-3).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Foley into Thomas because Thomas discloses a method of distorting an area of an image and Foley discloses the determinant of the transform matrix can be used to determine the magnification of the transform.

34. As per claim 6, Thomas demonstrated all the elements as applied to the rejection of dependent claim 3, supra.

Thomas discloses a method of distorting an area of an image using affine transformation. It is noted that Thomas does not explicitly disclose the extraction of rotation comprises calculating an angle from the elements of a linear transform matrix, however, this is known in the art as taught by Foley. Foley discloses that in affine transformation an angle of rotation from the transformation can be derived (page 203, the whole page).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Foley into Thomas because Thomas discloses a method of distorting an area of an image and Foley discloses the angle of the rotation can be calculated from the transformation in order to determine the amount of rotation due to the transformation.

35. Claims 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas and Reyzin as applied to claim 19 above, and further in view of Foley.

As per claim 20, Thomas and Reyzin demonstrated all the elements as applied to the rejection of dependent claim 19, supra.

Thomas and Reyzin disclose a method of distorting an area of an image using affine transformation. It is noted that Thomas and Reyzin do not explicitly disclose the one component of the distortion is a magnification amount, and the instructions to cause the computer to decompose the affine transformation further comprise instructions to calculate the determinant of the linear transform matrix, however, this is known in the art as taught by Foley. Foley discloses that "the determinant of the matrix tells us ... how much the cube is expanded or contracted by the transformation, page 1104, line 2-3).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Foley into Thomas and Reyzin because Thomas and Reyzin disclose a method of distorting an area of an image and Foley discloses the determinant of the transform matrix can be used to determine the magnification of the transform.

36. As per claim 21, Thomas and Reyzin demonstrated all the elements as applied to the rejection of dependent claim 19, supra.

Thomas and Reyzin disclose a method of distorting an area of an image using affine transformation. It is noted that Thomas and Reyzin do not explicitly disclose the one component of the distortion is an angular rotation amount, and the instructions to

cause the computer to decompose the affine transformation further comprise instructions to calculate an angle from the elements of the linear transform matrix, however, this is known in the art as taught by Foley. Foley discloses that in affine transformation an angle of rotation from the transformation can be derived (page 203, the whole page).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Foley into Thomas and Reyzin because Thomas and Reyzin disclose a method of distorting an area of an image and Foley discloses the angle of the rotation can be calculated from the transformation in order to determine the amount of rotation due to the transformation.

37. As per claim 22, Thomas and Reyzin demonstrated all the elements as applied to the rejection of dependent claim 19, supra.

Thomas and Reyzin disclose a method of distorting an area of an image using affine transformation. It is noted that Thomas and Reyzin do not explicitly disclose the one component of the distortion is a scaling amount, and the instructions to cause the computer to decompose the affine transformation further comprise instructions to calculate a pair of eigenvalues of the linear transform matrix, and wherein each eigenvalue represents the amount of scaling in a direction represented by a corresponding projection matrix, however, this is known in the art as taught by Foley. Foley discloses that, in affine transformation, eigenvector of the transformation can be calculated and it value is a scalar multiple of the vector derived from the transformation (page 1108-1109, A.6).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Foley into Thomas and Reyzin because Thomas and Reyzin disclose a method of distorting an area of an image using affine transformation and Foley discloses the eigenvalues can be derived from the transformation matrix in order to know the amount of magnification in each direction.

38. As per claim 23, Thomas and Reyzin demonstrated all the elements as applied to the rejection of dependent claim 22, supra.

As for a rotation is removed from the linear transform matrix prior to calculating the pair of eigenvalues, since affine transformation is a combination of scaling, rotation and skewing, it would have been obvious to remove the rotation from the transformation in order to calculate the amount of scaling due to skewing effect.

39. As per claim 24, Thomas and Reyzin demonstrated all the elements as applied to the rejection of dependent claim 22, supra.

As for a skew is removed from the linear transform matrix prior to calculating the pair of eigenvalues, since affine transformation is a combination of scaling, rotation and skewing, it would have been obvious to remove the skewing from the transformation in order to calculate the amount of scaling due to rotation effect.

40. Claims 12, 27 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas et al. as applied to claim 1 above, and further in view of Choi et al. (6,157,750).

41. As per claim 12, Thomas demonstrated all the elements as applied to the rejection of independent claim 1, supra.

Thomas discloses a method of distorting an area of an image using affine transformation. It is noted that Thomas does not explicitly disclose a user selects the area for the applying by the location of a virtual brush, however, this is known in the art as taught by Choi et a., hereinafter Choi. Choi discloses a method of transforming a basic shape element of a character by using a virtual brush (Figure 2 where the brush selects area to be transformed).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Choi into Thomas because Thomas discloses a method of distorting an area of an image using affine transformation and Choi discloses the transformation area can be selected by using a virtual brush in order to select a desired amount of transformation area.

42. As per claim 27, Thomas demonstrated all the elements as applied to the rejection of independent claim 16, supra.

Thomas discloses a method of distorting an area of an image using affine transformation. It is noted that Thomas does not explicitly disclose a user selects the area for the applying by the location of a virtual brush, however, this is known in the art as taught by Choi. Choi discloses a method of transforming a basic shape element of a character by using a virtual brush (Figure 2 where the brush selects area to be transformed).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Choi into Thomas because Thomas discloses a method of distorting an area of an image using affine transformation and

Choi discloses the transformation area can be selected by using a virtual brush in order to select a desired amount of transformation area.

43. As per claim 33, Thomas demonstrated all the elements as applied to the rejection of independent claim 1, supra.

Thomas discloses a method of distorting an area of an image using affine transformation. It is noted that Thomas does not explicitly disclose a user selects the area for the applying by the location of a virtual brush, however, this is known in the art as taught by Choi. Choi discloses a method of transforming a basic shape element of a character by using a virtual brush (Figure 2 where the brush selects area to be transformed).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Choi into Thomas because Thomas discloses a method of distorting an area of an image using affine transformation and Choi discloses the transformation area can be selected by using a virtual brush in order to select a desired amount of transformation area.

Response to Arguments

44. Applicant's arguments filed 12/29/2003 have been fully considered but they are not persuasive.

As per claims 1, 16 and 31, applicant alleges Thomas does not teach calculating a distortion local to an area of an image, extracting a component of the distortion and applying the extracted component to a different area of the image. In reply, the examine

notes that when a corner of the graph (Figure 3) is grabbed, that corner portion is distorted; the distortion is not limited to one point but to a plurality of points local to the area. As for applying the extracted component to a different area of the image, for the scaling operation, all four corners are affected (page 5 second paragraph).

As per claims 4, 19 and 36, applicant alleges neither Thomas nor Reyzin disclose calculating an affine transformation from a plurality of points. In reply, the examiner relies on Thomas to show distortion to a plurality of points (points local to the gab corner) and Reyzin for the affine transformation.

As per claims 5 and 9, applicant alleges Foley is silent about calculating an affine transform from a plurality of points. In reply, examiner notes Thomas discloses distortion can be performed by using affine transformation (page 7, last paragraph). Foley provides the knowledge that magnification factor can be known by calculating the determinant of a transform matrix.

As per claim 6, applicant's alleged claim limitation is not in the claim.

As per claims 20-24, applicant alleges Thomas does not teach applying the at least one component of the distortion to a second area. In replay, examiner notes in Figure 3 where the other corners are also distorted by distorting one corner.

As per claims 12, 27 and 33, applicant alleges Choi is silent about using a virtual brush to perform claim 1. In reply, examiner notes since virtual brush is used for pointing purpose, it would have been obvious to one of ordinary skill in the art to use it to replace the mouse for pointing purpose.

Allowable Subject Matter

45. Claims 7-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

46. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Inquiries

47. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Ryan Yang** whose telephone number is **(703) 308-6133**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Michael Razavi**, can be reached at **(703) 305-4713**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 305-47000377.

Ryan Yang
March 5, 2004

MICHAEL RAZAVI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600